

VERMILION RIVER TMDLS FOR DISSOLVED OXYGEN AND NITROGEN
Subsegments 060801 and 060802

US EPA Region 6

with cooperation from the
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(subsegments 060801 and 060802)

Executive Summary

Section 303(d) of the Federal Clean Water Act requires states to identify water bodies that are not meeting water quality standards and to develop total maximum daily pollutant loads for those water bodies. A total maximum daily load (TMDL) is the amount of a pollutant that a water body can assimilate without exceeding the established water quality standard for that pollutant. Through a TMDL, pollutant loads can be distributed or allocated to point sources and non-point sources discharging to the water body. This document includes TMDLs for two subsegments of the Vermilion River (060801 and 060802). Each subsegment has a TMDL for dissolved oxygen and nitrogen. This document includes a total of four TMDLs. These segments were listed on Louisiana's 1998 §303(d) list and on the October 28, 1999, Court Ordered §303(d) list.

A TMDL for dissolved oxygen was developed by LDEQ for these two subsegments in 1987 and approved by EPA Region 6 (Appendix B). The TMDL was reevaluated by LDEQ in December 1999 (Appendix A) and determined to be appropriate for these subsegments. It is recommended that a 50% reduction in man-made nonpoint source loading occur in the watershed to accelerate the progress toward support of designated uses and increase the margin of safety of the TMDL.

Table 4 of the reevaluation report summarizes the TMDL for these two subsegments. Table 4 is the sum of UBOD, ORG-N, NH₃N and NO₃-N. The summer TMDL = 38,306.7 lbs/day, and the Winter TMDL = 43,511.7 lbs/day. The nitrogen (ORG-N, NH₃N and NO₃-N) portion of each of these TMDLs is 10,180.5 lbs/day in the summer and 11,480.9 lbs/day in the winter (see Appendix A - the summer and winter loading spreadsheets.)

1. Introduction

The Louisiana Section 1998 303(d) list and the October 28, 1999, Court Ordered list include subsegments 060801 and 060802 targeted for dissolved oxygen and nitrogen Total Maximum Daily Loads (TMDLs). All of these segments have a priority ranking of 1, and were targeted for completion in calendar year 1999.

The purpose of a TMDL is to determine the pollutant loading that a water body can assimilate without exceeding the water quality standard for that pollutant. The TMDL also establishes the load reduction that is necessary to meet the standard in a water body. The TMDL consists of the wasteload allocation (WLA), the load allocation (LA), and a margin of safety (MOS). The WLA is the load allocated to point sources of the pollutant of concern, and the LA is the load allocated to non-point sources. The MOS is a percentage of the TMDL that accounts for the uncertainty in the relationship between the pollutant loads and the quality of the receiving water body. This document constitutes four TMDLs.

2. Water Body Description

See Appendix A pages 1-2 (“1999 Review and Assessment of the 1987 Vermilion River Watershed TMDL for Dissolved Oxygen,” LDEQ, December 1999) for a description of the watershed.

3. Applicable Water Quality Standards and Targets

Dissolved Oxygen

See Appendix A page 2 (“1999 Review and Assessment of the 1987 Vermilion River Watershed TMDL for Dissolved Oxygen,” LDEQ, December 1999) for a description of the applicable water quality standards.

Nitrogen

LDEQ’s water quality standards read “The naturally occurring range of nitrogen-phosphorus ratios shall be maintained. This range shall not apply to designated intermittent streams. To establish the appropriate range of ratios and compensate for natural seasonal fluctuations, the administrative authority will use site-specific studies to establish limits for nutrients. Nutrient concentrations that produce aquatic growth to the extent that it creates a public nuisance or interferes with designated water uses shall not be added to any surface waters.”

In addition, LDEQ issued a declaratory ruling on April 29, 1996, concerning this language and stated, “That DO directly correlates with overall nutrient impact is a well-established biological and ecological principle. Thus, when the LDEQ maintains and protects DO, the LDEQ is in effect also limiting and controlling nutrient concentrations and impacts.” The nitrogen loading required to maintain the dissolved oxygen standards is the nitrogen TMDL.

4. Loading Capacity and TMDL Formulation

A TMDL for dissolved oxygen was developed by LDEQ for these two subsegments in 1987 and approved by EPA Region 6 (Appendix B). The TMDL was reevaluated by LDEQ in December 1999 (Appendix A) and determined to be appropriate for these subsegments. Table 4 of Appendix A summarizes the loading capacity for dissolved oxygen for these two subsegments. The loading capacity in this case is also the equal to the dissolved oxygen TMDL. Table 4 is the sum of UBOD, ORG-N, NH₃N and NO₃-N. The summer TMDL = 38,306.7 lbs/day, and the Winter TMDL = 43,511.7 lbs/day. The nitrogen TMDL (ORG-N, NH₃N and NO₃-N) is 10,180.5 lbs/day in the summer and 11,480.9 lbs/day in the winter (see Appendix A - the summer and winter loading spreadsheets). To meet these loadings it is estimated that an additional 50% reduction in man-made nonpoint source loading should occur to accelerate the progress toward full support of the dissolved oxygen standard.

5. Load Allocations

The load allocation is the portion of the TMDL that is allocated to nonpoint sources. Table 4 of Appendix A summarizes the load allocations for these two subsegments. Table 4 is the sum of UBOD, ORG-N, NH3N and NO3-N) The summer load allocation = 30,554 lbs/day, and the Winter load allocation = 30,554 lbs/day. The load allocation portion of the nitrogen TMDL (ORG-N, NH3N and NO3-N) is 905 lbs/day in the summer and 905 lbs/day in the winter (see Appendix A - the summer and winter loading spreadsheets).

6. Wasteload Allocations

The wasteload allocation is the portion of the TMDL that is allocated to point sources. Table 4 of Appendix A summarizes the wasteload allocations for these two subsegments. Table 4 is the sum of UBOD, ORG-N, NH3N and NO3-N) The summer wasteload allocation = 6,202 lbs/day, and the Winter wasteload allocation = 10,366 lbs/day. The wasteload allocation portion of the nitrogen TMDL (ORG-N, NH3N and NO3-N) is 3,571 lbs/day in the summer and 4,872 lbs/day in the winter (see Appendix A - the summer and winter loading spreadsheets).

7. Margin of Safety

A margin of safety (MOS) accounts for any lack of knowledge or uncertainty concerning the relationship between load allocations and water quality. In the 1987 TMDL, there was an explicit 20% MOS that was associated with the wasteload allocation portion of the TMDL (see Appendix A, Table 4). Based on the reevaluation there is an explicit MOS of approximately 5%. In addition, the conservative model inputs (see Appendix A, p 4) are estimated to increase the overall MOS to greater than 10%. In addition, the 50% reduction in man-made nonpoint source loading will increase the MOS.

8. Seasonal Variation

Critical conditions for dissolved oxygen in Louisiana have been determined to be when there is negligible nonpoint run-off and low stream flow combined with high stream temperature. In addition, the models account for loadings that occur at higher flows by modeling sediment oxygen demand. Oxygen demanding pollutants that enter the stream during higher flows settle to the bottom and then exert the greatest oxygen demand during the high temperature seasons. In addition, the 1987 TMDL looked at the winter and summer seasons by varying temperature.

9. Other Relevant Information

Although not required by this TMDL, LDEQ utilizes funds under Section 106 of the federal Clean Water Act and under the authority of the Louisiana Environmental Quality Act to operate an established program for monitoring the quality of the state's surface waters. The LDEQ Surveillance Section collects surface water samples at various locations, utilizing appropriate sampling methods and procedures for ensuring the quality of the data collected. The objectives of the surface water monitoring program are to determine the quality of the state's surface waters, to develop a long-term data base for water quality trend analysis, and to monitor the effectiveness of pollution controls. The

data obtained through the surface water monitoring program is used to develop the state's biennial 305(b) report (*Water Quality Inventory*) and the 303(d) list of impaired waters. This information is also utilized in establishing priorities for the LDEQ nonpoint source program.

The LDEQ has implemented a watershed approach to surface water quality monitoring. Through this approach, the entire state is sampled over a five-year cycle with two targeted basins sampled each year. Long-term trend monitoring sites at various locations on the larger rivers and Lake Pontchartrain are sampled throughout the five-year cycle. Sampling is conducted on a monthly basis or more frequently if necessary to yield at least 12 samples per site each year. Sampling sites are located where they are considered to be representative of the waterbody. Under the current monitoring schedule, targeted basins follow the TMDL priorities. In this manner, the first TMDLs will have been implemented by the time the first priority basins will be monitored again in the second five-year cycle. This will allow the LDEQ to determine whether there has been any improvement in water quality following establishment of the TMDLs. As the monitoring results are evaluated at the end of each year, waterbodies may be added to or removed from the 303(d) list. The sampling schedule for the first five-year cycle is shown below. The Vermilion-Teche River Basin will be sampled again in 2003.

1998 – Mermentau and Vermilion-Teche River Basins

1999 - Calcasieu and Ouachita River Basins

2000 – Barataria and Terrebonne Basins

2001 – Lake Pontchartrain Basin and Pearl River Basin

2002 – Red and Sabine River Basins

(Atchafalaya and Mississippi Rivers will be sampled continuously.)

In addition to ambient water quality sampling in the priority basins, the LDEQ has increased compliance monitoring in those basins, following the same schedule. Approximately 1,000 to 1,100 permitted facilities in the priority basins were targeted for inspections. The goal set by LDEQ was to inspect all of those facilities on the list and to sample 1/3 of the minors and 1/3 of the majors. During 1998, 476 compliance evaluation inspections and 165 compliance sampling inspections were conducted throughout the Mermentau and Vermilion-Teche River Basins.

10. Public Participation

When EPA establishes a TMDL, 40 C.F.R. § 130.7(d)(2) requires EPA to publicly notice and seek comment concerning the TMDL. Pursuant to an October 1, 1999, Court Order, EPA prepared this TMDL. After submission of this TMDL to the Court, EPA commenced preparation of a notice seeking comments, information and data from the general and affected public. Comments and additional information were submitted during the public comment period and this Court Ordered TMDL was revised accordingly. EPA has transmitted this revised TMDL to the Court, and to the Louisiana Department of Environmental Quality (LDEQ) for incorporation into LDEQ's current water quality management plan.

APPENDICES

Appendix A: See "1999 Review and Assessment of the 1987 Vermilion River Watershed TMDL for Dissolved Oxygen," December 1999, LDEQ

Appendix B: See "Wasteload Allocation for the Vermilion River, March 26, 1987"

NOTE: For appendices please contact Ellen Caldwell, EPA Region 6, 1445 Ross Avenue, Dallas, TX 75202 (214) 665-7513.